



# Cost Estimating Format for Large Projects

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## INTRODUCTION

# Course Objective

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**To train participants to use the Cost Estimating Format (CEF) when formulating large projects.**

# Course Outline

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- ▶ **Unit 1: The CEF Concept**
- ▶ **Unit 2: The CEF Spreadsheet**
- ▶ **Unit 3: Developing Part A**
- ▶ **Unit 4: Selecting CEF Factors**
- ▶ **Unit 5: Applying the CEF**
- ▶ **Unit 6: Practical Exercise**

# Materials

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- ▶ **CEF Instructional Guide**
- ▶ **CEF Spreadsheet**
- ▶ **Participant's Package**
- ▶ **Public Assistance Guide**
- ▶ **R.S. Means Company Publications**

# CEF Users

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- ▶ **Project Officers**
- ▶ **Members of project formulation team**
- ▶ **Qualifications:**
  - ◆ **engineers or cost estimators**
  - ◆ **experience in design, construction, contracting**

# CEF Users Tasks

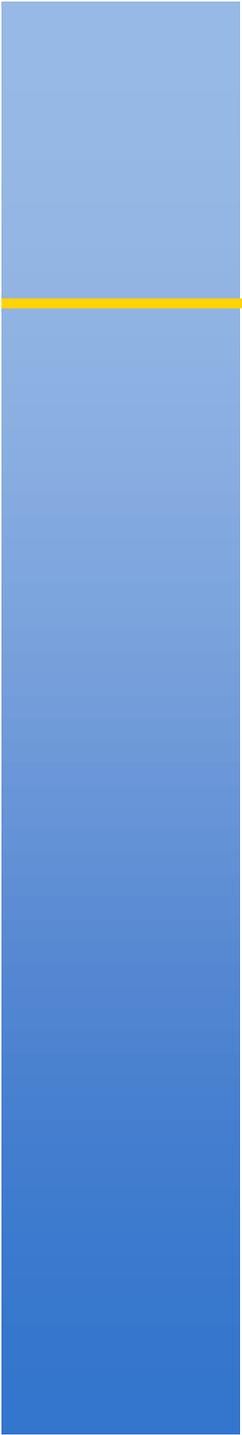
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- ▶ **Determine if CEF should be used.**
- ▶ **Develop the scope of work.**
- ▶ **Identify appropriate unit cost data.**
- ▶ **Complete the CEF Spreadsheet.**
- ▶ **Complete the Project Worksheet.**
- ▶ **Keep the PAC informed of problems.**

# CEF Users Responsibilities

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- ▶ **Promote good relations with States and applicants.**
- ▶ **Know eligibility criteria.**
- ▶ **Be aware of special considerations.**
- ▶ **Be aware of disaster-specific procedures.**
- ▶ **Provide good documentation.**
- ▶ **Use CEF carefully.**



# Questions?

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# Unit 1

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## THE CEF CONCEPT

# Objectives

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- ▶ **Describe the purpose of CEF.**
- ▶ **Identify the components of CEF.**
- ▶ **Describe CEF application during project formulation.**
- ▶ **Determine if CEF is appropriate for a project.**

# Background

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- ▶ **Inadequacies of the PA Program**
  - Large Project estimating process**
    - ◆ **Damage Survey Reports**
    - ◆ **Northridge**
- ▶ **Improvements**
  - ◆ **Grants Acceleration Program**
  - ◆ **Project Formulation Process**

# Advantages

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- ▶ **Provides consistent means of estimating**
- ▶ **Provides applicant with greater degree of confidence**
- ▶ **Encourages more effective project management**
- ▶ **Reduces FEMA's administrative costs**

# CEF Is . . .

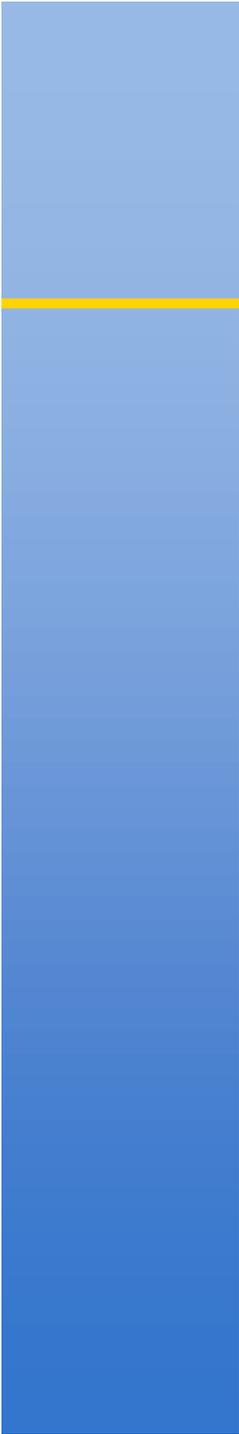
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- ▶ **Excel spreadsheet for:**
  - ◆ **organizing items of work**
  - ◆ **applying factors**
  - ◆ **deriving a cost estimate**
- ▶ **Uniform method for preparing estimates**
- ▶ **Forward-Pricing Tool**

# CEF Is Not . . .

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- ▶ **An “expert” system**
- ▶ **A shortcut to developing good estimates**
- ▶ **A replacement for professional expertise**



# Future Goal

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**Use CEF as a final cost  
settlement instrument.**

# Typical Construction Cost Estimating

## CSI Division 1 -- General Requirements

**OWNERS'  
RESERVE  
FOR  
CHANGE  
ORDERS**

### WORK-IN-TRADES

Div. 2 -	Site Work	Div. 9 -	Finishes
Div. 3 -	Concrete	Div. 10 -	Specialties
Div. 4 -	Masonry	Div. 11 -	Equipment
Div. 5 -	Metals	Div. 12 -	Furnishings
Div. 6 -	Carpentry	Div. 13 -	Special Construction
Div. 7 -	Moisture Control	Div. 14 -	Conveying Systems
Div. 8 -	Doors, Windows, Glass	Div. 15 -	Mechanical
		Div. 16 -	Electrical

### OWNER'S COSTS

A&E, Permits, Plan Review, Project Management

# CEF Components

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- ▶ **A - CONSTRUCTION COSTS**
- ▶ **B - GENERAL REQUIREMENTS**
- ▶ **C - COST CONTINGENCIES**
- ▶ **D - OVERHEAD / PROFIT**
- ▶ **E - OWNER'S ESCALATION**
- ▶ **F - PERMITS / FEES**
- ▶ **G - OWNER'S RESERVE**
- ▶ **H - MANAGEMENT / DESIGN**

# Project Formulation

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- ▶ **Qualify project for CEF**
- ▶ **Identify unit cost data**
- ▶ **Determine scope of work**
- ▶ **Complete CEF Spreadsheet**
- ▶ **Complete Project Worksheet**
- ▶ **Project approval/obligate funds**

# Criteria for Application

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- ▶ **Large projects**
- ▶ **Permanent work (Categories C-G)**
- ▶ **Eligible work**
- ▶ **Less than 50 percent complete**
- ▶ **4+ months to reach 90 percent completion**

# EXERCISE

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- ▶ **Qualifying projects for CEF**
  - ◆ **five projects**

# Review of Objectives

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- ▶ **Describe the purpose of CEF**
- ▶ **Identify the components of CEF**
- ▶ **Describe CEF application during project formulation**
- ▶ **Determine if CEF is appropriate for a project**

# UNIT 2



## THE CEF SPREADSHEET

# Objectives

- **Complete all components of the CEF spreadsheet.**
- **Describe spreadsheet capabilities.**
- **Transfer information to a Project Worksheet.**
- **Identify information submitted with Project Worksheet.**

# CEF Spreadsheet Components

- **CEF Fact sheet**
- **Part A**
- **Summary of Completed Work**
- **Summary of Uncompleted Work**
- **Total Project Summary**
- **CEF Notes**

# CEF Spreadsheet Capabilities



- **Categorizing work**
- **Manipulating Part A**
- **Assigning factors**
- **Adding subtotals**
- **Links between spreadsheets**

# CEF Spreadsheet Capabilities



- **Categorizing work**
- **Manipulating Part A**
- **Assigning factors**
- **Adding subtotals**
- **Links between worksheets**

# The Project Worksheet



- **Completed by PO**
- **Components:**
  - Project information/scope of work**
  - Project cost**
  - Line item adjustments**
- **Submitted to PAC with supporting documentation**

# Documentation



- **Project Worksheet**
- **CEF Spreadsheet**
- **Photographs, maps, plans, specifications**
- **Permits and clearances**
- **Cost summary sheets**
- **Insurance and mitigation information**
- **Etc.**

# Review of Objectives



- **Complete all components of the CEF spreadsheet.**
- **Describe spreadsheet capabilities.**
- **Transfer information to a Project Worksheet.**
- **Identify information submitted with Project Worksheet.**

# UNIT 3

## DEVELOPING PART A

# Objectives

- Prepare an accurate scope of work.
- Organize work items appropriately.
- Identify appropriate unit cost data.
- Complete Part A.
- Evaluate Part A for completeness.



# Scope of Work

## Sources of Eligibility Criteria

- Stafford Act
- 44 CFR:
  - Part 206: PA Program eligibility
  - Part 13: Allowable Costs
- FEMA policies



# Scope of Work

## Important Eligibility Issues

- Basic eligibility criteria
  - Damage must be disaster-related
  - Restoration to pre-disaster condition
- Improvements may be eligible as:
  - Codes and Standards upgrades
  - Hazard Mitigation
- Scope must not include ineligible items



# Scope of Work (cont'd)

## Important Eligibility Issues

- An eligible facility must:
  - be the responsibility of an eligible applicant
  - be located in a designated disaster area
  - not be under the specific authority of another Federal agency
  - be in active use at the time of the disaster



# Scope of Work Components

- Location
- Damage cause and description
- Damage dimensions
- Scope of work to repair damage:
  - Work items
  - Dimensions and quantities



# Organizing Part A

## Overview

- Completed vs. Uncompleted
- Permanent vs. Non-permanent
- Type of work
- CSI Division



# Organizing Part A

## Categorizing Work

- Completed work
- Uncompleted work
- Permanent work
- Non-permanent work



# Organizing Part A

## Types of Work

- Repair
- Retrofit
- New Construction
- Hazard Mitigation
- Other



# Organizing Part A

## Work Items

- Organize by CSI Division
- Components:
  - Description and code
  - Quantity and units
  - Unit price
  - City adjustment factor



# Organizing Part A

## Unit Cost Data

- Low bids or construction contracts
- Force account costs
- Local unit cost information
- R.S. Means Company cost data
- FEMA cost codes



# Organizing Part A

## Analyzing Unit Cost Data

- In-place costs
- Overhead and profit
- Union and non-union rates
- Disaster-related changes
- Lump sum items
- City adjustment factor



# Organizing Part A

## Review

- Completed vs. Uncompleted
- Permanent vs. Non-permanent
- Type of work
- CSI Division



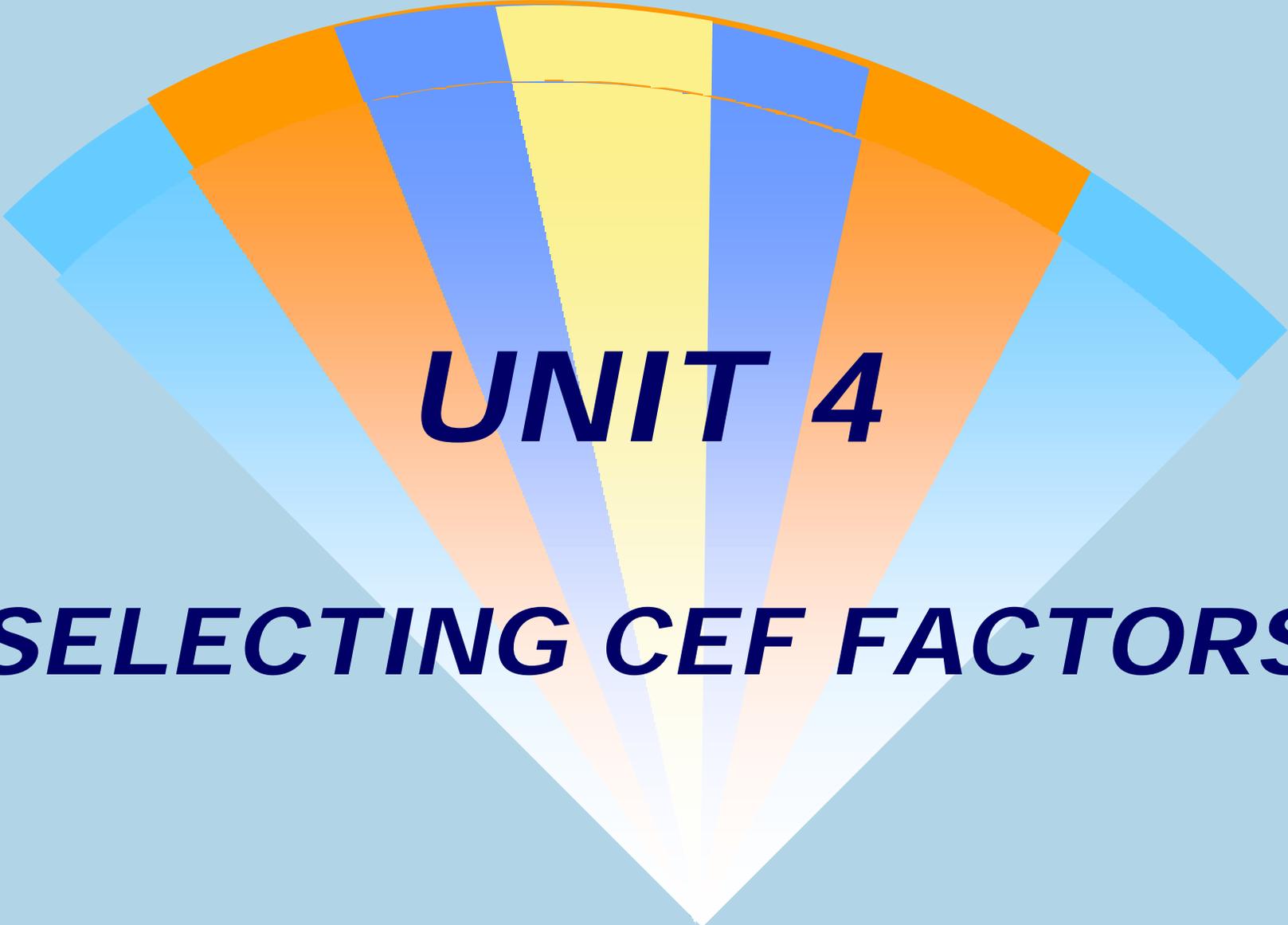
# EXERCISE



# Review of Objectives

- Prepare an accurate scope of work.
- Organize work items appropriately.
- Identify appropriate unit cost data.
- Complete Part A.
- Evaluate Part A for completeness.





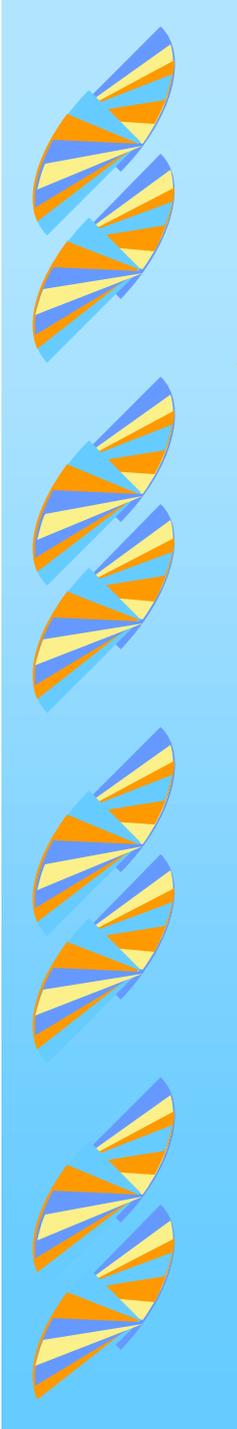
***UNIT 4***

***SELECTING CEF FACTORS***

# Objectives

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- ▲ **Describe the factors in Parts B-H.**
- ▲ **Apply factors appropriately.**



# CEF Factors

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**B: General requirements**

**C: Cost contingencies**

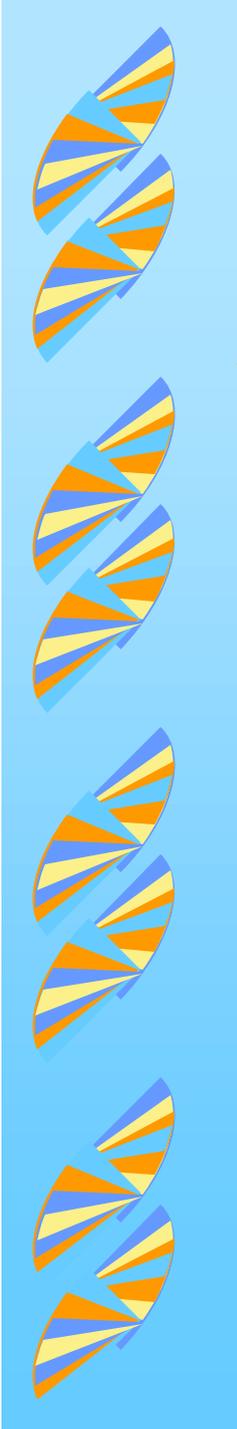
**D: Overhead and profit**

**E: Inflation**

**F: Permits and fees**

**G: Reserve for change orders**

**H: Project management and design**



# CEF Factors

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## Do:

Quantify in Part A to the greatest extent practicable

## Don't:

Duplicate costs considered in Part A items, with factors

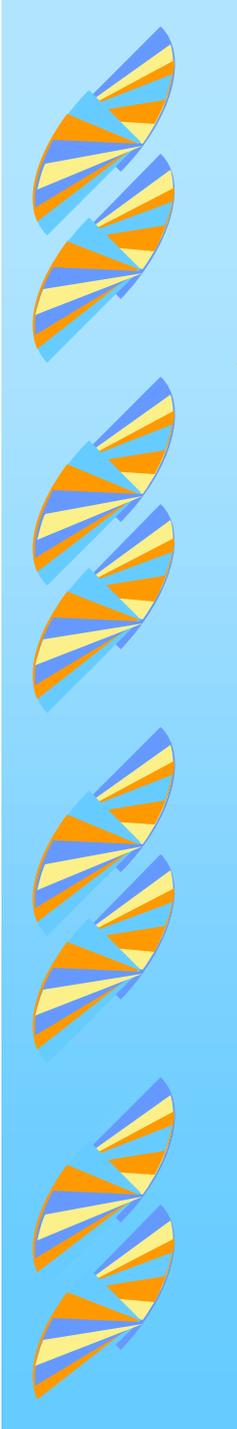
# Part B

## General Requirements

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- ▲ **Safety and security measures**
- ▲ **Temporary services and utilities**
- ▲ **Quality control**
- ▲ **Submittals**
- ▲ **On-site project management**



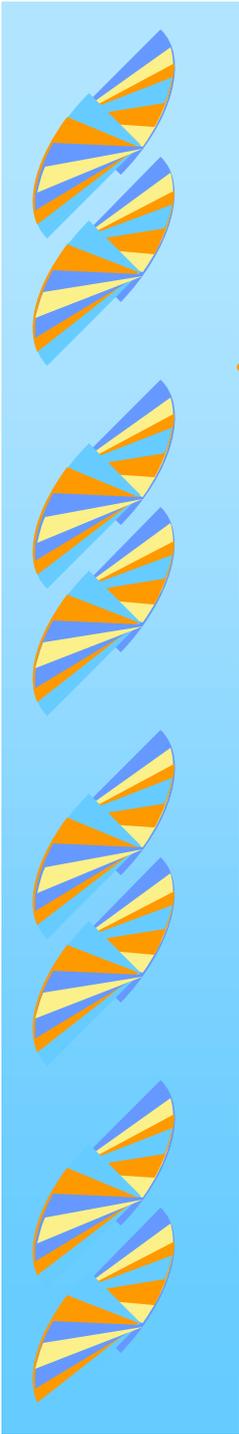


# Part C

## Cost Contingencies

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- ▲ **Level of design work completed**
- ▲ **Project “constructability”**
- ▲ **Site access, staging, and storage**
- ▲ **Economy of scale**



# Part D

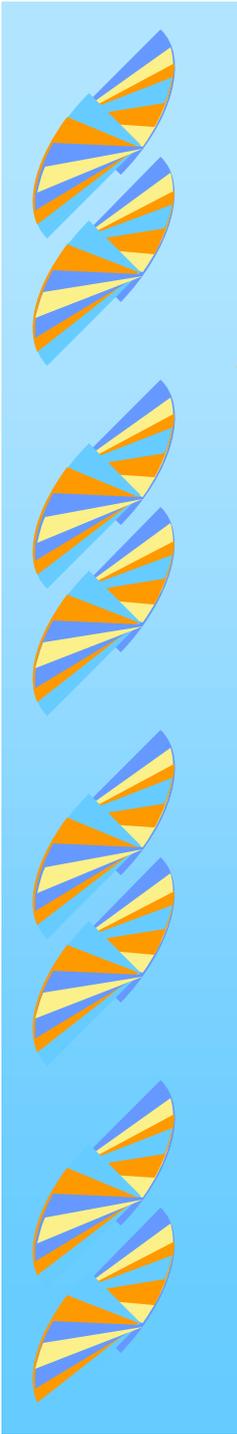
## Overhead and Profit

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▲ Home office overhead

▲ Insurance and bonds

▲ Profit



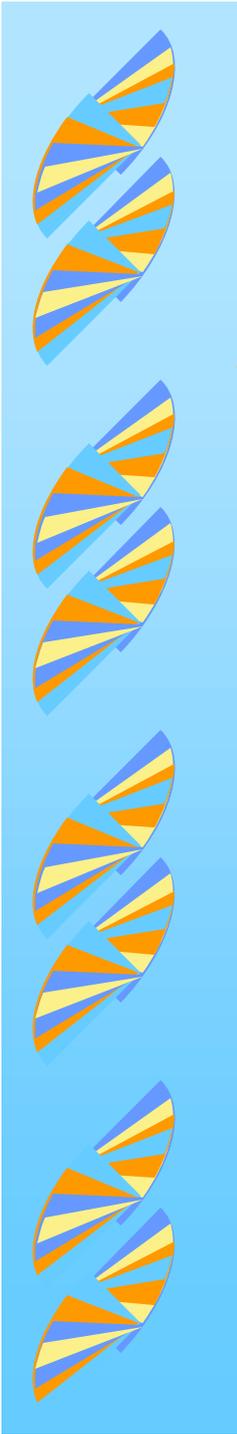
# Part E Inflation

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## ▲ Duration of:

- ◆ Design
- ◆ Bid/award
- ◆ Construction

## ▲ Midpoint of uncompleted construction

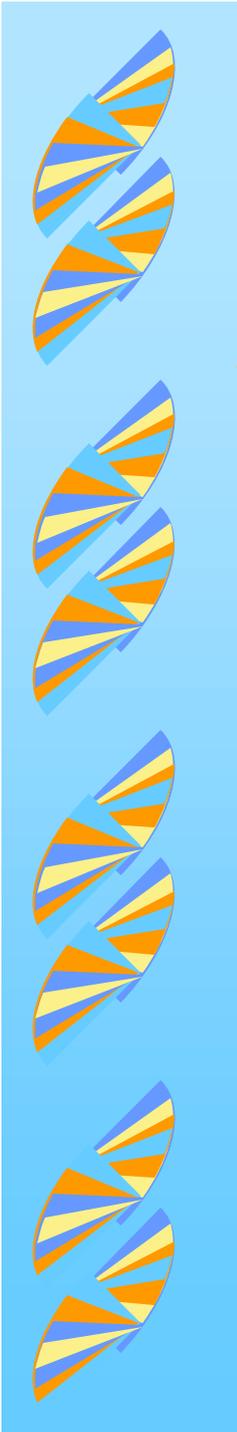


# Part F

## Permits and Fees

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- ▲ **Plan review fees**
- ▲ **Construction permit fees**
- ▲ **Fee waivers**

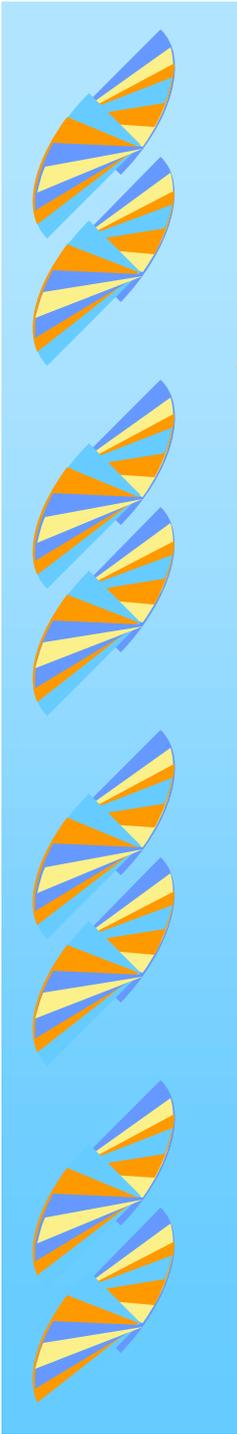


# Part G

## Reserve for Construction

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- ▲ **The applicant controls the reserve**
- ▲ **It is for changes to eligible scope of work**
- ▲ **Incidental costs**
- ▲ **Not used for:**
  - ◆ **Upgrades**
  - ◆ **Ineligible work**



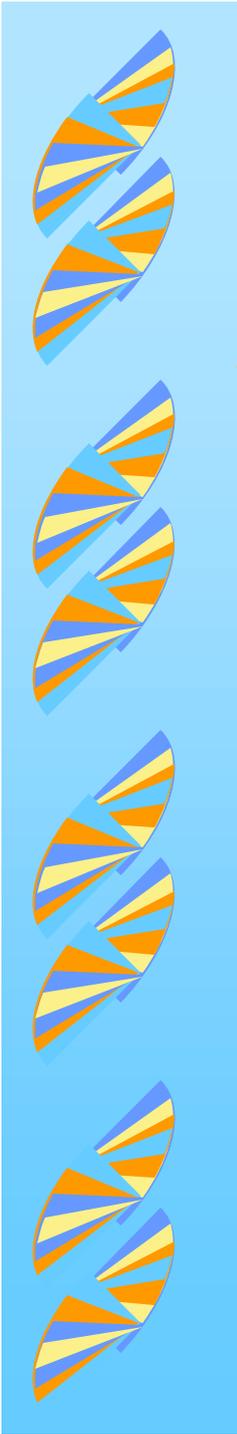
# Part H

## Management and Design

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### Applicant's design phase costs for:

- ◆ **Managing the design process**
- ◆ **Basic design and inspection services normally performed by A&E firm**
- ◆ **Managing the construction phase (third party or in-house)**



# Review of Objectives

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- ▲ **Describe the factors in Parts B-H.**
- ▲ **Apply factors appropriately.**

# UNIT 5

## APPLYING THE CEF

# Objectives

**Apply the CEF for:**

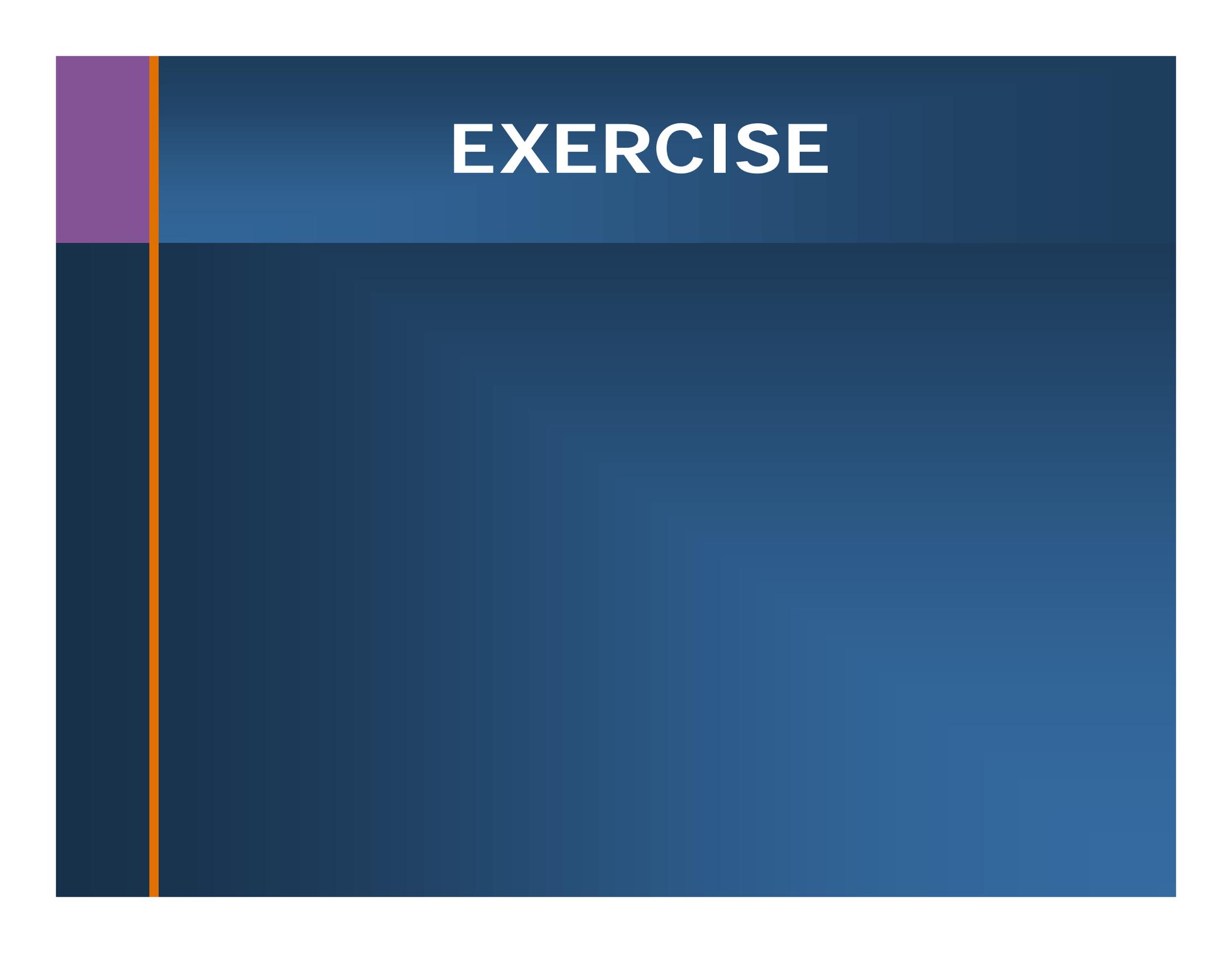
- **Stage of completion**
- **Force account work**
- **PA Program funding options**

# Stages of Completion

- No work completed
- A&E report available
- Bid/contract available
- Partially completed work

# Force Account Work

- **All work is force account: adjust factors**
- **Combination: prepare separate Part As**
- **Lack of information: assume contract work**



# EXERCISE

# PA Program Funding Options

## Hazard Mitigation

- **Must be eligible, cost effective, feasible**
- **For cost-benefit analysis:**
  - Use construction costs (Part A) only
- **After approval:**
  - Add mitigation items to Part A
  - Run CEF to determine final estimate

# PA Program Funding Options

## Improved Projects

- Restoration to pre-disaster design is eligible
- Cost of improvements borne by applicant
- Prepare Part A without improvements
- Run CEF to determine final estimate
- Grant capped at final estimate amount

# PA Program Funding Options

## Alternate Projects

- Restoration to pre-disaster design is eligible
- Applicant may request alternate project
- Prepare Part A for eligible work only
- Run CEF to determine final estimate
- Grant capped at 90% of Federal share of the estimate
- Excess costs borne by applicant

# PA Program Funding Options

## Repair vs. Replacement

If repair > 50% of replacement cost,  
replacement is eligible.

- Repair: does not include codes/standards
- Replacement: pre-disaster design with codes/standards
- Comparison: use construction costs (Part A) only

# Review of Objectives

**Apply the CEF for:**

- **Stage of completion.**
- **Force account work.**
- **PA Program funding options.**

# UNIT 6

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## Exercise

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# Objective

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**Develop an estimate using  
the CEF.**

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# EXERCISE

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# **The CEF Large Project Report**

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- **Refer to Appendix C of IG**
  - **PAO prepares report for FEMA Headquarters**
  - **POs may assist PAO in preparation**
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# Questions?

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